



SEQUENCE LISTING

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<120> Novel Bacterial RNase P Proteins and
Their Use in Identifying Antibacterial Compounds

<130> 50093/016001

<140> US 09/516,061
<141> 2000-03-01

<160> 95

<170> FastSEQ for Windows Version 4.0

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JAN 16 2003

TECH CENTER 1600/2900

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<212> DNA
<213> Streptococcus mutans

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<212> DNA
<213> Klebsiella pneumoniae

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<212> DNA
<213> Salmonella paratyphi

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cggccgcact	gtgcgcctggc	tcgcgggtcc	tgatagccct	tattcgggtc	tatcaacgccc	420
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<212> DNA
<213> *Pseudomonas aeruginosa*

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<213> Corynebacterium diphtheriae
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tcqcqcatq tttqatqcgq tqcqgttcta 510

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<210> 6
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<213> *Chlamydia trachomatis*

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<211> 492
<212> DNA

<213> Vibrio cholerae

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ttgataatgt tcgggagtt acaaacgtaa ctcccgattt aatgcgtacg tactcaaaaat 420
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acgaccgttc gc 492

<210> 8

<211> 492

<212> DNA

<213> Neisseria gonorrhoea

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ccttgcctgt tttgcggtag ccctgtcgaa ttccggcg acgcgcacga cgaatccctg 180
aggccgcacgc cggtttttgt tcaatctgaa ccagtcgcgg atgacgcgtt tcataatagtt 240
ccgctcggtt ggcgcgttgg cggtttttt gccgaccacc agaccgatgc gggatggtc 300
cagcccgtt ccgtttgagc gcaacttgc cagcaggatcg cggctgcggc ggttctgaa 360
tgcaaaaacg gatgaaaaat catccgttt taacaagcggtt tactgccttc cgaagcggta 420
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<210> 9

<211> 492

<212> DNA

<213> Neisseria meningitidis

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cgccgcacgc cggtttttgt tcaatctgaa ccagtcgcgg atgacgcgtt tcataataatt 240
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tgcaaaaacg gatgaaaaat catccgttt caacaagcggtt tactgccttc cgaagcggta 420
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<210> 10

<211> 462

<212> DNA

<213> Streptococcus pyogenes

<400> 10

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atgtaaattt tttgtaaagct cttgatactc caaagattcg acacccttac gggcaatcac 180
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tccatcctta aatatggctt ggaaatctt ctcacgctt acacgatagg tcttcttcaa 420
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1
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Cont.

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<211> 492
<212> DNA
<213> *Bordetella pertussis*

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cgtgaggctt gccgggtgtca gcttgctgtc cagccgcacc acgtaatccct gggccggcag 180
ggcaagccgg cgagcccgga acgcttcgcg gatgaccgc ttcaaggat tgcgcgtcac 240
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atcagcaggg gcacagggcg aggccgtgac aataaagaaa gcccctcggg ccagtcgccc 360
gccttgagg gcccggcactcgaggg gcgatgcaat cgccctccg cagggagcgt 420
ggcgccgcgc atgggtgacg tgacggagac tggcgacggg gcccggcgcg atgctcctgt 480
tacaggcaat cc 492

<210> 12
<211> 534
<212> DNA
<213> *Porphyromonas gingivalis*

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ttactcggtt ttcaaaagccg atgaaggatc atttccggca attctgatca gactctttg 120
catcgctctc tccactgtac gaaagtccagg aagttcatcc gatactacca taaatgcaat 180
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gccaagatag aggcgttcgc ttttggatag gccaatgta ggcggagagg tcatttcccg 480
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<210> 13
<211> 495
<212> DNA
<213> *Streptococcus pneumoniae*

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taatacatgg agtagatttt ttcatttc tgcgtatccc aaggttcga ctccctttcg 180
agcaatgaca acaaagtgcg catcttctac cagactccct tttgcatttgc ggataatatg 240
ccgaatccgt cgcttaattt gatttcttagt gacggcattc cccagtttt tgcttaactga 300
tagacctact cggaaacggt tttctgggt ttcttaattgg tagaccacaa atttgcgatt 360
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<210> 14
<211> 465
<212> DNA
<213> *Clostridium difficile*

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aagtatataat attactaaat atttgtttgc aaaagatttg ccgtgttat atactttct 360
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acacagctat gaatcgtaat tatttacaca aaaaggccac ctttg 465

<210> 15
<211> 447
<212> DNA
<213> *Camphylobacter jejuni*

<400> 15
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agaaaagttca gtgatttcat ttttagctac aaaaatataat ttgccccatctt gaagatatct 180
ttcaaaactta gcaaacaag ctcttaaaat tcgtttgaa cgatttctaa ccactgcttt 240
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gatcacaccc tcgcaatgcc atttttgcc tactttatata acagatgaaa attctcggtt 360
tgtgctaaat ttatcaaaat tttcacaca gcaagtctt ttctacctt agcgcgtt 420
gcattgatca ctttgcgacc attttta 447

<210> 16
<211> 480
<212> DNA
<213> *Bacillus anthracis*

<400> 16
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aatttcggta cgcaactactg catttcctat cttcttgctg acagaaaaggc caataacgaaa 300
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tccttttga aaaaccgtct ggaattcatc attctttttt atacgatgtt ttttcttcat 420
atcaatttgac actcctgttag ttcatcagcg gaaattcaactt attattagaa aaaaagacca 480

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<211> 480
<212> DNA
<213> *Mycobacterium avium*

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gtcgggttcg gagtcgcgc ggggggtggac gacgtgtcg ggctgcccga tgcgggttcc 360
gtgcttcacc gtcgcgtcaa actcggttga ccgcgtcatg cgggtgcgtg cgggaagcac 420
cgcgaaagac ctgacgtcgatc acaggcaga gagcgcgcgg cggacccttgc ggcggccgacc 480

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<211> 474
<212> DNA
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aagattaaaa gagcaatacg tgaaaatttc aaagtacata agtcgcataat attggccaaa 300
gatattattt taatagcaag acagccagct aaagatatga cgactttaca aatacagaat 360
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<210> 19

<211> 474

<212> DNA

<213> *Staphylococcus aureus*

<400> 19

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gaccattttc gcttaggtat tagtgttct aaaaaactag gtaatgcagt gtttagaaac 240
aagattaaaa gagcaatacg tgaaaatttc aaagtacata agtcgcataat attggccaaa 300
gatattattt taatagcaag acagccagct aaagatatga cgactttaca aatacagaat 360
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ggtaggggaa ggaaaacatt aaccactcaa cacatccgaa agtcttacct caga 474

<210> 20

<211> 119

<212> PRT

<213> *Streptococcus mutans*

<400> 20

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20 25 30
Ser Leu Glu Lys Asp Gln Ser His Tyr Arg Val Gly Leu Ser Val Gly
35 40 45
Lys Arg Leu Gly Asn Ala Val Val Arg Asn Ala Ile Lys Arg Lys Leu
50 55 60
Arg His Val Leu Met Glu Leu Gly Pro Tyr Leu Gly Thr Gln Asp Phe
65 70 75 80
Val Val Ile Ala Arg Lys Gly Val Glu Leu Asp Tyr Ser Thr Met
85 90 95
Lys Lys Asn Leu Val His Val Leu Lys Leu Ala Lys Leu Tyr Gln Glu
100 105 110
Gly Ser Ile Arg Glu Lys Glu
115

C
Cmt
<210> 21

<211> 119

<212> PRT

<213> *Klebsiella pneumoniae*

<400> 21

Val Val Lys Leu Ala Phe Pro Arg Glu Leu Arg Leu Leu Thr Pro Ser
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Ile Thr Ile Leu Gly Arg Leu Asn Ser Leu Gly His Pro Arg Ile Gly
35 40 45
Leu Thr Val Ala Lys Lys Asn Val Lys Arg Ala His Glu Arg Asn Arg

50 55 60
Ile Lys Arg Leu Thr Arg Glu Ser Phe Arg Leu Arg Gln His Glu Leu
65 70 75 80
Pro Pro Met Asp Phe Val Val Val Ala Lys Arg Gly Val Ala Asp Leu
85 90 95
Asp Asn Arg Ala Leu Ser Glu Ala Leu Glu Lys Leu Trp Arg Arg His
100 105 110
Cys Arg Leu Ala Arg Gly Ser
115

<210> 22
<211> 110
<212> PRT
<213> *Salmonella paratyphi*

<400> 22
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Ser Thr Gly Cys Thr Pro Gln Ile Thr Ile Leu Gly Arg Leu Asn Ser
20 25 30
Leu Gly His Pro Arg Ile Gly Leu Thr Val Ala Lys Lys Asn Val Arg
35 40 45
Arg Ala His Glu Arg Asn Arg Ile Lys Arg Leu Thr Arg Glu Ser Phe
50 55 60
Arg Leu Arg Gln His Glu Leu Pro Ala Met Asp Phe Val Val Ala
65 70 75 80
Lys Lys Gly Val Ala Asp Leu Asp Asn Arg Ala Leu Ser Glu Ala Leu
85 90 95
Glu Lys Leu Trp Arg Arg His Cys Arg Leu Ala Arg Gly Ser
100 105 110

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Cont.
<210> 23
<211> 135
<212> PRT
<213> *Pseudomonas aeruginosa*

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Gln Phe Ser Ala Val Phe Asp Ser Pro Thr Gly Lys Val Pro Gly Lys
20 25 30
His Val Leu Leu Leu Ala Arg Glu Asn Gly Leu Asp His Pro Arg Leu
35 40 45
Gly Leu Val Ile Gly Lys Lys Asn Val Lys Leu Ala Val Gln Arg Asn
50 55 60
Arg Leu Lys Arg Leu Ile Arg Glu Ser Phe Arg His Asn Gln Glu Thr
65 70 75 80
Leu Ala Gly Trp Asp Ile Val Val Ile Ala Arg Lys Gly Leu Gly Glu
85 90 95
Leu Glu Asn Pro Glu Leu His Gln Gln Phe Gly Lys Leu Trp Lys Arg
100 105 110
Leu Leu Arg Asn Arg Pro Arg Thr Glu Ser Pro Ala Asp Ala Pro Gly
115 120 125
Val Ala Asp Gly Thr His Ala
130 135

<210> 24
<211> 129
<212> PRT
<213> Corynebacterium diphtheriae

<400> 24
Val Thr Leu Thr Ser Ser Asn Arg Thr Thr Val Leu Pro Ser Gln His
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Lys Leu Ser Asn Ser Glu Gln Phe Arg Ala Thr Ile Arg Lys Gly Lys
20 25 30
Arg Ala Gly Arg Ser Thr Val Val Leu His Phe Tyr Ala Glu Ala Thr
35 40 45
Ala Gly Asn Leu Ala Thr Ala Gly Gly Pro Arg Phe Gly Leu Val Val
50 55 60
Ser Lys Ala Val Gly Asn Ala Val Thr Arg His Arg Val Ser Arg Gln
65 70 75 80
Leu Arg His Val Val Ile Ala Met Lys Asp Gln Phe Pro Ala Ser Ser
85 90 95
His Val Val Val Arg Ala Ile Pro Pro Ala Ala Thr Ala Ser Tyr Glu
100 105 110
Glu Leu Arg Ala Asp Val Gln Ala Ala Leu Asp Lys Leu Asn Arg Lys
115 120 125
Arg

<210> 25
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<212> PRT
<213> Chlamydia trachomatis

<400> 25
Val His Arg Leu Thr Leu Pro Lys Ser Ala Arg Leu Leu Lys Arg Lys
1 5 10 15
Gln Phe Val Tyr Val Gln Arg Cys Gly Gln Tyr Cys Arg Thr Asp Gln
20 25 30
Ala Thr Leu Arg Ile Val Pro Ser Arg His Ser Asn Ile Arg Lys Val
35 40 45
Gly Val Thr Val Ser Lys Lys Phe Gly Lys Ala His Gln Arg Asn Arg
50 55 60
Phe Lys Arg Ile Val Arg Glu Ala Phe Arg His Val Arg Pro Asn Leu
65 70 75 80
Pro Ala Cys Gln Val Val Val Ser Pro Lys Gly Gly Thr Leu Pro Asn
85 90 95
Phe Gly Lys Leu Ser Ala Asp Leu Leu Lys His Ile Pro Glu Ala Leu
100 105 110
Pro Leu Val Thr Ser Ser Lys
115

<210> 26
<211> 122
<212> PRT
<213> Vibrio cholerae

<400> 26
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20 25 30
Gly Ser Pro His Leu Thr Ile Ile Ala Arg Ala Asn Asn Leu Ser His
35 40 45
Pro Arg Leu Gly Leu Ala Val Pro Lys Lys Gln Ile Lys Thr Ala Val
50 55 60
Gly Arg Asn Arg Phe Lys Arg Ile Cys Arg Glu Ser Phe Arg Leu His
65 70 75 80
Gln Asn Gln Leu Ala Asn Lys Asp Phe Val Val Ile Ala Lys Lys Ser
85 90 95
Ala Gln Asp Leu Ser Asn Glu Glu Leu Phe Asn Leu Leu Gly Lys Leu
100 105 110
Trp Gln Arg Leu Ser Arg Pro Ser Arg Gly
115 120

<210> 27
<211> 123
<212> PRT
<213> Neisseria gonorrhoea

<400> 27
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Asp Asp Phe Ser Ser Val Phe Ala Phe Arg Asn Arg Arg Ser Arg Asp
20 25 30
Leu Leu Gln Val Ser Arg Ser Asn Gly Asn Gly Leu Asp His Pro Arg
35 40 45
Ile Gly Leu Val Val Gly Lys Lys Thr Ala Lys Arg Ala Asn Glu Arg
50 55 60
Asn Tyr Met Lys Arg Val Ile Arg Asp Trp Phe Arg Leu Asn Lys Asn
65 70 75 80
Arg Leu Pro Pro Gln Asp Phe Val Val Arg Val Arg Arg Lys Phe Asp
85 90 95
Arg Ala Thr Ala Lys Gln Ala Arg Ala Glu Leu Ala Gln Leu Met Phe
100 105 110
Gly Asn Pro Ala Thr Gly Cys Gly Lys Gln Val
115 120

C
Cont.
<210> 28
<211> 123
<212> PRT
<213> Neisseria meningitidis

<400> 28
Val Ile Leu Asp Tyr Arg Phe Gly Arg Gln Tyr Arg Leu Leu Lys Thr
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Asp Asp Phe Ser Ser Val Phe Ala Phe Arg Asn Arg Arg Ser Arg Asp
20 25 30
Leu Leu Gln Val Ser Arg Ser Asn Gly Asn Gly Leu Asp His Pro Arg
35 40 45
Ile Gly Leu Val Val Gly Lys Lys Thr Ala Lys Arg Ala Asn Glu Arg
50 55 60
Asn Tyr Met Lys Arg Val Ile Arg Asp Trp Phe Arg Leu Asn Lys Asn
65 70 75 80
Arg Leu Pro Pro Gln Asp Phe Val Val Arg Val Arg Arg Lys Phe Asp
85 90 95
Arg Ala Thr Ala Lys Gln Ala Arg Ala Glu Leu Ala Gln Leu Met Phe
100 105 110

Gly Asn Pro Ala Thr Gly Cys Arg Lys Gln Ala
115 120

<210> 29
<211> 113
<212> PRT
<213> Streptococcus pyogenes

<400> 29
Val Lys Arg Glu Lys Asp Phe Gln Ala Ile Phe Lys Asp Gly Lys Ser
1 5 10 15
Thr Ala Asn Arg Lys Phe Val Ile Tyr His Leu Asn Arg Gly Gln Asp
20 25 30
His Phe Arg Val Gly Ile Ser Val Gly Lys Lys Ile Gly Asn Ala Val
35 40 45
Thr Arg Asn Ala Val Lys Arg Lys Ile Arg His Val Ile Met Ala Leu
50 55 60
Gly His Gln Leu Lys Ser Glu Asp Phe Val Val Ile Ala Arg Lys Gly
65 70 75 80
Val Glu Ser Leu Glu Tyr Gln Glu Leu Gln Gln Asn Leu His His Val
85 90 95
Leu Lys Leu Ala Gln Leu Leu Glu Lys Gly Phe Glu Ser Glu Glu Lys
100 105 110
His

<210> 30
<211> 123
<212> PRT
<213> Bordetella pertussis

<400> 30
Met Pro Arg Ala Thr Leu Pro Ala Glu Ala Arg Leu His Arg Pro Ser
1 5 10 15
Glu Phe Ala Ala Ala Leu Lys Gly Arg Arg Leu Ala Arg Gly Ala Phe
20 25 30
Phe Ile Val Ser Ala Ser Pro Cys Ala Pro Ala Asp Asp Gln Pro Ala
35 40 45
Arg Ala Arg Leu Gly Leu Val Ile Ala Lys Arg Phe Ala Ala Arg Ala
50 55 60
Val Thr Arg Asn Thr Leu Lys Arg Val Ile Arg Glu Ala Phe Arg Ala
65 70 75 80
Arg Arg Leu Ala Leu Pro Ala Gln Asp Tyr Val Val Arg Leu His Ser
85 90 95
Lys Leu Thr Pro Ala Ser Leu Thr Ala Leu Lys Arg Ser Ala Arg Ala
100 105 110
Glu Val Asp Ala His Phe Thr Arg Ile Ala Arg
115 120

<210> 31
<211> 137
<212> PRT
<213> Porphyromonas gingivalis

<400> 31
Met Thr Ser Pro Pro Thr Phe Gly Leu Ser Lys Ser Glu Arg Leu Tyr

1	5	10	15												
Leu	Arg	Asp	Glu	Ile	Asn	Thr	Val	Phe	Gly	Glu	Gly	Lys	Ala	Phe	Val
20	25	30													
Val	Tyr	Pro	Leu	Arg	Val	Val	Tyr	Arg	Leu	Gly	Ser	Glu	His	Arg	Val
35	40	45													
Ala	Tyr	Ser	Ser	Met	Leu	Val	Ser	Val	Ala	Lys	Lys	Arg	Phe	Arg	Arg
50	55	60													
Ala	Val	Lys	Arg	Asn	Arg	Val	Lys	Arg	Leu	Val	Arg	Glu	Ala	Tyr	Arg
65	70	75	80												
Leu	Asn	Lys	His	Leu	Leu	Asn	Asp	Val	Leu	Gln	Glu	Arg	Gln	Ile	Tyr
85	90	95													
Ala	Thr	Ile	Ala	Phe	Met	Val	Val	Ser	Asp	Glu	Leu	Pro	Asp	Phe	Arg
100	105	110													
Thr	Val	Glu	Arg	Ala	Met	Gln	Lys	Ser	Leu	Ile	Arg	Ile	Ala	Gly	Asn
115	120	125													
Val	Pro	Ser	Ser	Ala	Leu	Lys	Asn	Glu							
130	135														

<210> 32

<211> 124

<212> PRT

<213> Streptococcus pneumoniae

<400> 32

1	5	10	15												
Val	Leu	Lys	Lys	Asn	Phe	Arg	Val	Lys	Arg	Glu	Lys	Asp	Phe	Lys	Ala
20	25	30													
Ile	Phe	Lys	Glu	Gly	Thr	Ser	Phe	Ala	Asn	Arg	Lys	Phe	Val	Val	Tyr
35	40	45													
Gln	Leu	Glu	Asn	Gln	Lys	Asn	Arg	Phe	Arg	Val	Gly	Leu	Ser	Val	Ser
50	55	60													
Lys	Lys	Leu	Gly	Asn	Ala	Val	Thr	Arg	Asn	Gln	Ile	Lys	Arg	Arg	Ile
65	70	75	80												
Phe	Val	Val	Ile	Ala	Arg	Lys	Gly	Val	Glu	Thr	Leu	Gly	Tyr	Ala	Glu
85	90	95													
Met	Glu	Lys	Asn	Leu	Leu	His	Val	Leu	Lys	Leu	Ser	Lys	Ile	Tyr	Arg
100	105	110													
Glu	Gly	Asn	Gly	Ser	Glu	Lys	Glu	Thr	Lys	Val	Asp				
115	120														

C
Cont.
<210> 33

<211> 114

<212> PRT

<213> Clostridium difficile

<400> 33

1	5	10	15												
Met	Asp	Phe	Asn	Arg	Thr	Lys	Gly	Leu	Lys	Lys	Asp	Ser	Asp	Phe	Arg
20	25	30													
Lys	Val	Tyr	Lys	His	Gly	Lys	Ser	Phe	Ala	Asn	Lys	Tyr	Leu	Val	Ile
35	40	45													
Tyr	Ile	Leu	Lys	Asn	Lys	Ser	Asp	Tyr	Ser	Arg	Val	Gly	Ile	Ser	Val
50	55	60													
Ser	Lys	Lys	Val	Gly	Lys	Ala	Ile	Thr	Arg	Asn	Arg	Val	Arg	Arg	Leu
65	70	75	80												
Ile	Lys	Glu	Ala	Tyr	Arg	Leu	Asn	Ile	Asp	Glu	Lys	Ile	Lys	Pro	Gly

Tyr Asp Ile Val Phe Ile Ala Arg Val Ser Ser Lys Asp Ala Thr Phe
85 90 95
Lys Asp Ile Asp Lys Ser Ile Lys Asn Leu Val Lys Arg Thr Asp Ile
100 105 110
Ser Ile

<210> 34
<211> 108
<212> PRT
<213> *Camphylobacter jejuni*

<400> 34
Val Lys Asn Phe Asp Lys Phe Ser Thr Asn Glu Glu Phe Ser Ser Val
1 5 10 15
Tyr Lys Val Gly Lys Lys Trp His Cys Glu Gly Val Ile Ile Phe Tyr
20 25 30
Leu Asn Ser Tyr Glu Lys Lys Ile Ala Val Val Ala Ser Lys Lys Val
35 40 45
Gly Lys Ala Val Val Arg Asn Arg Ser Lys Arg Ile Leu Arg Ala Leu
50 55 60
Phe Ala Lys Phe Glu Arg Tyr Leu Gln Asp Gly Lys Tyr Ile Phe Val
65 70 75 80
Ala Lys Asn Glu Ile Thr Glu Leu Ser Phe Ser Arg Leu Glu Lys Asn
85 90 95
Leu Lys Trp Gly Leu Lys Leu Glu Cys Phe Lys
100 105

<210> 35
<211> 119
<212> PRT
<213> *Bacillus anthracis*

C
Cont
<400> 35
Met Lys Lys Lys His Arg Ile Lys Lys Asn Asp Glu Phe Gln Thr Val
1 5 10 15
Phe Gln Lys Gly Lys Ser Asn Ala Asn Arg Gln Phe Val Val Tyr Gln
20 25 30
Leu Asp Lys Glu Glu Gln Pro Asn Phe Arg Ile Gly Leu Ser Val Ser
35 40 45
Lys Lys Ile Gly Asn Ala Val Val Arg Asn Arg Ile Lys Arg Met Ile
50 55 60
Arg Gln Ser Ile Thr Glu Leu Lys Asp Glu Ile Asp Ser Gly Lys Asp
65 70 75 80
Phe Val Ile Ile Ala Arg Lys Pro Cys Ala Glu Met Thr Tyr Glu Glu
85 90 95
Leu Lys Lys Ser Leu Ile His Val Phe Lys Arg Ser Gly Met Lys Arg
100 105 110
Ile Lys Ser Ser Val Arg Lys
115

<210> 36
<211> 119
<212> PRT
<213> *Mycobacterium avium*

<400> 36

Val Leu Pro Ala Arg Asn Arg Met Thr Arg Ser Thr Glu Phe Asp Ala
1 5 10 15
Thr Val Lys His Gly Thr Arg Met Ala Gln Pro Asp Ile Val Val His
20 25 30
Leu Arg Arg Asp Ser Glu Pro Asp Asp Glu Ser Ala Gly Pro Arg Val
35 40 45
Gly Leu Val Val Gly Lys Ala Val Gly Thr Ala Val Gln Arg His Arg
50 55 60
Val Ala Arg Arg Leu Arg His Val Ala Arg Ala Leu Leu Gly Glu Leu
65 70 75 80
Glu Pro Ser Asp Arg Leu Val Ile Arg Ala Leu Pro Gly Ser Arg Thr
85 90 95
Ala Ser Ser Ala Arg Leu Ala Gln Glu Leu Gln Arg Cys Leu Arg Arg
100 105 110
Met Pro Ala Gly Thr Gly Pro
115

<210> 37

<211> 117

<212> PRT

<213> Staphylococcus aureus

C
Cont.
<400> 37

Met Leu Leu Glu Lys Ala Tyr Arg Ile Lys Lys Asn Ala Asp Phe Gln
1 5 10 15
Arg Ile Tyr Lys Lys Gly His Ser Val Ala Asn Arg Gln Phe Val Val
20 25 30
Tyr Thr Cys Asn Asn Lys Glu Ile Asp His Phe Arg Leu Gly Ile Ser
35 40 45
Val Ser Lys Lys Leu Gly Asn Ala Val Leu Arg Asn Lys Ile Lys Arg
50 55 60
Ala Ile Arg Glu Asn Phe Lys Val His Lys Ser His Ile Leu Ala Lys
65 70 75 80
Asp Ile Ile Val Ile Ala Arg Gln Pro Ala Lys Asp Met Thr Thr Leu
85 90 95
Gln Ile Gln Asn Ser Leu Glu His Val Leu Lys Ile Ala Lys Val Phe
100 105 110
Asn Lys Lys Ile Lys
115

<210> 38

<211> 117

<212> PRT

<213> Staphylococcus aureus

<400> 38

Met Leu Leu Glu Lys Ala Tyr Arg Ile Lys Lys Asn Ala Asp Phe Gln
1 5 10 15
Arg Ile Tyr Lys Lys Gly His Ser Val Ala Asn Arg Gln Phe Val Val
20 25 30
Tyr Thr Cys Asn Asn Lys Glu Ile Asp His Phe Arg Leu Gly Ile Ser
35 40 45
Val Ser Lys Lys Leu Gly Asn Ala Val Leu Arg Asn Lys Ile Lys Arg
50 55 60
Ala Ile Arg Glu Asn Phe Lys Val His Lys Ser His Ile Leu Ala Lys
65 70 75 80

Asp Ile Ile Val Ile Ala Arg Gln Pro Ala Lys Asp Met Thr Thr Leu
85 90 95
Gln Ile Gln Asn Ser Leu Glu His Val Leu Lys Ile Ala Lys Val Phe
100 105 110
Asn Lys Lys Ile Lys
115

<210> 39
<211> 71
<212> PRT
<213> Escherichia coli

<400> 39
Leu Arg Leu Leu Thr Pro Ser Gln Phe Thr Phe Val Phe Arg Ile Gly
1 5 10 15
Leu Thr Val Ala Lys Lys Asn Val Arg Arg Ala His Glu Arg Asn Arg
20 25 30
Ile Lys Arg Leu Thr Arg Glu Ser Phe Arg Leu Arg Gln His Glu Leu
35 40 45
Asp Phe Val Val Val Ala Lys Lys Gly Val Ala Asp Leu Asp Asn Arg
50 55 60
Ala Leu Ser Glu Ala Leu Glu
65 70

<210> 40
<211> 71
<212> PRT
<213> Proteus mirabilis

<400> 40
Leu Arg Leu Leu Thr Pro Lys His Phe Asn Phe Val Phe Arg Ile Gly
1 5 10 15
Leu Thr Ile Ala Lys Lys Asn Val Lys Arg Ala His Glu Arg Asn Arg
20 25 30
Ile Lys Arg Leu Ala Arg Glu Tyr Phe Arg Leu His Gln His Gln Leu
35 40 45
Asp Phe Val Val Leu Val Arg Lys Gly Val Ala Glu Leu Asp Asn His
50 55 60
Gln Leu Thr Glu Val Leu Gly
65 70

<210> 41
<211> 71
<212> PRT
<213> Haemophilus influenzae

<400> 41
Leu Arg Leu Leu Thr Pro Ile Gln Phe Lys Asn Val Phe Arg Leu Gly
1 5 10 15
Leu Thr Val Ala Lys Lys His Leu Lys Arg Ala His Glu Arg Asn Arg
20 25 30
Ile Lys Arg Leu Val Arg Glu Ser Phe Arg Leu Ser Gln His Arg Leu
35 40 45
Asp Phe Val Phe Val Ala Lys Asn Gly Ile Gly Lys Leu Asp Asn Asn
50 55 60
Thr Phe Ala Gln Ile Leu Glu

65

70

<210> 42
<211> 71
<212> PRT
<213> Pseudomonas putida

<400> 42
Lys Asn Leu Leu Thr Pro Arg His Phe Lys Ala Val Phe Arg Leu Gly
1 5 10 15
Leu Val Ile Gly Lys Lys Ser Val Lys Leu Ala Val Gln Arg Asn Arg
20 25 30
Leu Lys Arg Leu Met Arg Asp Ser Phe Arg Leu Asn Gln Gln Leu Leu
35 40 45
Asp Ile Val Ile Val Ala Arg Lys Gly Leu Gly Glu Ile Glu Asn Pro
50 55 60
Glu Leu His Gln His Phe Gly
65 70

<210> 43
<211> 71
<212> PRT
<213> Buchnera aphidicola

<400> 43
Ser Lys Leu Leu Lys Ser Thr Asn Phe Gln Tyr Val Phe Arg Leu Gly
1 5 10 15
Leu Ser Ile Ser Arg Lys Asn Ile Lys His Ala Tyr Arg Arg Asn Lys
20 25 30
Ile Lys Arg Leu Ile Arg Glu Thr Phe Arg Leu Leu Gln His Arg Leu
35 40 45
Asp Phe Val Val Ile Ala Lys Lys Asn Ile Val Tyr Leu Asn Asn Lys
50 55 60
Lys Ile Val Asn Ile Leu Glu
65 70

C
Cont.
<210> 44
<211> 71
<212> PRT
<213> Salmonella typhi

<220>
<221> VARIANT
<222> 31
<223> Xaa = Any Amino Acid

<400> 44
Leu Arg Leu Leu Thr Pro Ala His Phe Thr Phe Val Phe Arg Ile Gly
1 5 10 15
Leu Thr Val Ala Lys Lys Asn Val Arg Arg Ala His Glu Arg Xaa Arg
20 25 30
Ile Lys Arg Leu Thr Arg Glu Ser Phe Arg Leu Arg Gln His Glu Leu
35 40 45
Asp Phe Val Val Val Ala Lys Lys Gly Val Ala Asp Leu Asp Asn Arg
50 55 60
Ala Leu Ser Glu Ala Leu Glu

65

70

<210> 45
<211> 71
<212> PRT
<213> Yersinia pestis

<400> 45
Leu Arg Leu Leu Thr Pro Ser His Phe Thr Phe Val Phe Arg Ile Gly
1 5 10 15
Leu Thr Val Ala Lys Lys His Val Lys Arg Ala His Glu Arg Asn Arg
20 25 30
Ile Lys Arg Leu Thr Arg Glu Ser Phe Arg Leu His Gln His Ala Leu
35 40 45
Asp Phe Val Val Leu Val Lys Lys Gly Val Ala Asp Leu Asp Asn Arg
50 55 60
Ala Leu Thr Glu Ala Leu Glu
65 70

<210> 46
<211> 71
<212> PRT
<213> Klebsiella pneumoniae

<400> 46
Leu Arg Leu Leu Thr Pro Ser His Phe Thr Phe Val Phe Arg Ile Gly
1 5 10 15
Leu Thr Val Ala Lys Lys Asn Val Lys Arg Ala His Glu Arg Asn Arg
20 25 30
Ile Lys Arg Leu Thr Arg Glu Ser Phe Arg Leu Arg Gln His Glu Leu
35 40 45
Asp Phe Val Val Val Ala Lys Arg Gly Val Ala Asp Leu Asp Asn Arg
50 55 60
Ala Leu Ser Glu Ala Leu Glu
65 70

C
Cont
<210> 47
<211> 66
<212> PRT
<213> Salmonella paratyphi

<400> 47
Ile Arg Leu Pro Ala Thr Ser Thr Arg Ile Gly Leu Thr Val Ala Lys
1 5 10 15
Lys Asn Val Arg Arg Ala His Glu Arg Asn Arg Ile Lys Arg Leu Thr
20 25 30
Arg Glu Ser Phe Arg Leu Arg Gln His Glu Leu Asp Phe Val Val Val
35 40 45
Ala Lys Lys Gly Val Ala Asp Leu Asp Asn Arg Ala Leu Ser Glu Ala
50 55 60
Leu Glu
65

<210> 48
<211> 71

<212> PRT

<213> Vibrio cholerae

<400> 48

Leu Arg Leu Leu Thr Pro Glu His Tyr Gln Lys Val Phe Arg Leu Gly
1 5 10 15
Leu Ala Val Pro Lys Lys Gln Ile Lys Thr Ala Val Gly Arg Asn Arg
20 25 30
Phe Lys Arg Ile Cys Arg Glu Ser Phe Arg Leu His Gln Asn Gln Leu
35 40 45
Asp Phe Val Val Ile Ala Lys Lys Ser Ala Gln Asp Leu Ser Asn Glu
50 55 60
Glu Leu Phe Asn Leu Leu Gly
65 70

<210> 49

<211> 71

<212> PRT

<213> Pseudomonas aeruginosa

<400> 49

Lys Arg Leu Leu Thr Ala Arg Gln Phe Ser Ala Val Phe Arg Leu Gly
1 5 10 15
Leu Val Ile Gly Lys Lys Asn Val Lys Leu Ala Val Gln Arg Asn Arg
20 25 30
Leu Lys Arg Leu Ile Arg Glu Ser Phe Arg His Asn Gln Glu Thr Leu
35 40 45
Asp Ile Val Val Ile Ala Arg Lys Gly Leu Gly Glu Leu Glu Asn Pro
50 55 60
Glu Leu His Gln Gln Phe Gly
65 70

<210> 50

<211> 71

<212> PRT

<213> Shewanella putrefaciens

C
Cont.

<400> 50

Leu Arg Leu Leu Thr Pro Ala Gln Phe Lys Ser Val Phe Arg Leu Gly
1 5 10 15
Leu Thr Val Ala Lys Arg Tyr Val Lys Arg Ala Asn Gln Arg Asn Arg
20 25 30
Ile Lys Arg Val Ile Arg Asp Ser Phe Arg Leu Asn Gln His Asn Ile
35 40 45
Asp Ile Val Val Leu Val Arg Asn Gly Val Met Glu Met Glu Asn Ala
50 55 60
Glu Leu Asn Gly Leu Ile Glu
65 70

<210> 51

<211> 71

<212> PRT

<213> Coxiella burnetii

<400> 51

Trp Arg Ile Arg Thr Thr Ala Glu Phe Arg Arg Ile Tyr Arg Leu Gly

1 5 10 15
Val Val Ala Ser Lys Arg Asn Val Arg Lys Ala Val Trp Arg Asn Arg
20 25 30
Val Arg Arg Val Val Lys Glu Ala Phe Arg Ile Arg Lys Lys Asp Leu
35 40 45
Asp Ile Val Val Val Ala Lys Ala Ser Ser Val Glu Ala Asp Asn Lys
50 55 60
Glu Leu Tyr Glu Cys Ile Asn
65 70

<210> 52
<211> 70
<212> PRT
<213> Rickettsia prowazekii

<400> 52
Thr Ser Leu Lys Asn Gln Lys Glu Phe Glu Leu Ile Asn Leu Gly Ile
1 5 10 15
Lys Val Ser Arg Lys Leu Asn Lys Lys Ala Val Val Arg Asn Lys Ile
20 25 30
Lys Arg Arg Ile Arg His Leu Met Arg Ile Ile Val Asn Asp Ser Ala
35 40 45
Ile Ile Ile Pro Lys Lys Gly Phe Glu Glu Ile Asn Phe Ser His
50 55 60
Leu Gln Tyr Glu Leu Ser
65 70

<210> 53
<211> 73
<212> PRT
<213> Caulobacter crescentus

<400> 53
Glu Arg Leu Arg Lys Arg Pro Asp Phe Leu Leu Ala Ala Arg Val Gly
1 5 10 15
Phe Thr Ala Thr Lys Lys Ile Gly Gly Ala Val Glu Arg Asn Arg Ala
20 25 30
Lys Arg Arg Leu Arg Glu Ala Ala Arg Leu Val Leu Pro Leu Asp Tyr
35 40 45
Val Phe Ile Ala Arg Gly Gly Thr Gly Thr Arg Glu Trp Ala Arg Leu
50 55 60
Leu Asp Asp Val Lys Thr Ala Leu Ile
65 70

<210> 54
<211> 74
<212> PRT
<213> Helicobacter pylori 26695

<400> 54
Asp Ser Leu Lys Asn Lys Ser Glu Phe Asp Arg Val Tyr Lys Leu Gly
1 5 10 15
Leu Ser Val Ser Lys Lys Val Gly Asn Ala Val Lys Arg Asn Leu Ile
20 25 30
Lys Arg Arg Leu Arg Ser Leu Thr Leu Lys His Ala Ala Leu Cys Ala
35 40 45

Leu Val Phe Val Pro Arg Ser Asp Cys Tyr His Leu Asp Phe Trp Ala
50 55 60
Leu Glu Lys His Phe Leu Glu Met Leu Thr
65 70

<210> 55
<211> 74
<212> PRT
<213> Helicobacter pylori J99

<400> 55
Asp Ser Leu Lys Asn Lys Ser Glu Phe Asp Arg Val Tyr Lys Leu Gly
1 5 10 15
Leu Ser Val Ser Lys Lys Val Gly Asn Ala Val Lys Arg Asn Leu Ile
20 25 30
Lys Arg Arg Leu Arg Ser Leu Val Thr Arg His Ala Ala Leu Cys Ala
35 40 45
Leu Val Phe Val Pro Arg Ser Asp Cys Tyr His Leu Asp Phe Trp Ala
50 55 60
Leu Glu Lys His Phe Leu Glu Met Leu Thr
65 70

<210> 56
<211> 74
<212> PRT
<213> Campylobacter jejuni

<400> 56
Asp Lys Phe Ser Thr Asn Glu Glu Phe Ser Ser Val Tyr Lys Ile Ala
1 5 10 15
Val Val Ala Ser Lys Lys Val Gly Lys Ala Val Val Arg Asn Arg Ser
20 25 30
Lys Arg Ile Leu Arg Ala Leu Phe Ala Lys Phe Glu Arg Tyr Leu Lys
35 40 45
Tyr Ile Phe Val Ala Lys Asn Glu Ile Thr Glu Leu Ser Phe Ser Arg
50 55 60
Leu Glu Lys Asn Leu Lys Trp Gly Leu Lys
65 70

C
Cont.
<210> 57
<211> 71
<212> PRT
<213> Neisseria gonorrhoeae

<400> 57
Tyr Arg Leu Leu Lys Thr Asp Asp Phe Ser Ser Val Phe Arg Ile Gly
1 5 10 15
Leu Val Val Gly Lys Lys Thr Ala Lys Arg Ala Asn Glu Arg Asn Tyr
20 25 30
Met Lys Arg Val Ile Arg Asp Trp Phe Arg Leu Asn Lys Asn Arg Leu
35 40 45
Asp Phe Val Val Arg Val Arg Arg Lys Phe Asp Arg Ala Thr Ala Lys
50 55 60
Gln Ala Arg Ala Glu Leu Ala
65 70

<210> 58
<211> 71
<212> PRT
<213> *Neisseria meningitidis*

<400> 58
Tyr Arg Leu Leu Lys Thr Asp Asp Phe Ser Ser Val Phe Arg Ile Gly
1 5 10 15
Leu Val Val Gly Glu Lys Thr Ala Lys Arg Ala Asn Glu Arg Asn Tyr
20 25 30
Met Lys Arg Val Ile Arg Asp Trp Phe Arg Leu Asn Lys Asn Arg Leu
35 40 45
Asp Phe Val Val Arg Val Arg Arg Lys Phe Asp Arg Ala Thr Ala Lys
50 55 60
Gln Ala Arg Ala Glu Leu Ala
65 70

<210> 59
<211> 75
<212> PRT
<213> *Bordetella pertussis*

<400> 59
Ala Arg Leu His Arg Pro Ser Glu Phe Ala Ala Ala Leu Arg Leu Gly
1 5 10 15
Leu Val Ile Ala Lys Arg Phe Ala Ala Arg Ala Val Thr Arg Asn Thr
20 25 30
Leu Lys Arg Val Ile Arg Glu Ala Phe Arg Ala Arg Arg Leu Ala Leu
35 40 45
Asp Tyr Val Val Arg Leu His Ser Lys Leu Thr Pro Ala Ser Leu Thr
50 55 60
Ala Leu Lys Arg Ser Ala Arg Ala Glu Val Asp
65 70 75

<210> 60
<211> 70
<212> PRT
<213> *Thiobacillus ferrooxidans*

C
Cont
<400> 60
Asp Arg Leu Arg Gln Lys Val Ala Ile Gln Arg Thr Leu Arg Leu Gly
1 5 10 15
Leu Ala Val Ser Arg Lys Val Gly Asn Ala Val Val Arg Asn Arg Ile
20 25 30
Lys Arg Arg Leu Arg Glu Ala Phe Arg Gln Gln Ser Val Arg Thr Asp
35 40 45
Val Leu Val Val Ala Arg Pro Ser Ala Arg Gln Leu Ser Met Arg Ala
50 55 60
Met Gly Ala Tyr Leu Gln
65 70

<210> 61
<211> 70
<212> PRT
<213> *Streptomyces bikiniensis*

<400> 61
Asn Arg Leu Arg Arg Glu Asp Phe Ala Thr Ala Val Arg Ala Gly
1 5 10 15
Phe Val Val Ser Lys Ala Val Gly Gly Ala Val Val Arg Asn Gln Val
20 25 30
Lys Arg Arg Leu Lys His Leu Val Cys Asp Arg Leu Ser Ala Leu Leu
35 40 45
Val Val Val Arg Ala Leu Pro Gly Ala Gly Asp Ala Asp His Ala Gln
50 55 60
Leu Ala Arg Asp Leu Asp
65 70

<210> 62
<211> 70
<212> PRT
<213> Streptomyces coelicolor

<400> 62
Asn Arg Leu Arg Arg Glu Asp Phe Ala Thr Ala Val Arg Ala Gly
1 5 10 15
Phe Val Val Ser Lys Ala Val Gly Val Ala Val Val Arg Asn Lys Val
20 25 30
Lys Arg Arg Leu Arg His Leu Met Arg Asp Arg Ile Asp Leu Leu Leu
35 40 45
Val Val Val Arg Ala Leu Pro Gly Ala Gly Asp Ala Asp His Ala Gln
50 55 60
Leu Ala Arg Asp Leu Asp
65 70

<210> 63
<211> 74
<212> PRT
<213> Micrococcus luteus

<400> 63
Arg Arg Val Arg Thr Pro Ala Glu Phe Arg His Leu Gly Arg Ala Gly
1 5 10 15
Phe Val Val Ser Lys Ala Val Gly Asn Ala Val Thr Arg Asn Arg Val
20 25 30
Lys Arg Arg Leu Arg Ala Val Val Ala Glu Gln Met Arg Leu Val Leu
35 40 45
Val Gln Val Arg Ala Leu Pro Ala Ala Ala Glu Ala Asp Tyr Ala Leu
50 55 60
Leu Arg Arg Glu Thr Val Gly Ala Leu Gly
65 70

*C
cont*

<210> 64
<211> 71
<212> PRT
<213> Mycobacterium tuberculosis

<400> 64
Asn Arg Met Arg Arg Ser Ala Asp Phe Glu Thr Thr Val Arg Val Gly
1 5 10 15
Leu Ile Ile Ala Lys Ser Val Gly Ser Ala Val Glu Arg His Arg Val
20 25 30

Ala Arg Arg Leu Arg His Val Ala Gly Ser Ile Val Lys Glu Leu Asp
35 40 45
His Val Val Ile Arg Ala Leu Pro Ser Ser Arg His Val Ser Ser Ala
50 55 60
Arg Leu Glu Gln Gln Leu Arg
65 70

<210> 65
<211> 71
<212> PRT
<213> Mycobacterium leprae

<400> 65
Asn Arg Met Arg Arg Ser Ser Glu Phe Asp Ala Thr Val His Val Gly
1 5 10 15
Leu Ile Ile Ala Lys Thr Val Gly Ser Ala Val Glu Arg His Arg Val
20 25 30
Ala Arg Arg Leu Arg His Val Ala Arg Thr Met Leu Gly Glu Leu Asp
35 40 45
Gln Val Val Ile Arg Ala Leu Pro Ser Ser Arg Asn Val Ser Ser Ala
50 55 60
Trp Leu Ala Gln Gln Leu Arg
65 70

<210> 66
<211> 71
<212> PRT
<213> Mycobacterium bovis

<400> 66
Asn Arg Met Arg Arg Ser Ala Asp Phe Glu Thr Thr Val Arg Val Gly
1 5 10 15
Leu Ile Ile Ala Lys Ser Val Gly Ser Ala Val Glu Arg His Arg Val
20 25 30
Ala Arg Arg Leu Arg His Val Ala Gly Ser Ile Val Lys Glu Leu Asp
35 40 45
His Val Val Ile Arg Ala Leu Pro Ser Ser Arg His Val Ser Ser Ala
50 55 60
Arg Leu Glu Gln Gln Leu Arg
65 70

C
1
Cont

<210> 67
<211> 71
<212> PRT
<213> Mycobacterium avium

<400> 67
Asn Arg Met Thr Arg Ser Thr Glu Phe Asp Ala Thr Val Arg Val Gly
1 5 10 15
Leu Val Val Gly Lys Ala Val Gly Thr Ala Val Gln Arg His Arg Val
20 25 30
Ala Arg Arg Leu Arg His Val Ala Arg Ala Leu Leu Gly Glu Leu Asp
35 40 45
Arg Leu Val Ile Arg Ala Leu Pro Gly Ser Arg Thr Ala Ser Ser Ala
50 55 60
Arg Leu Ala Gln Glu Leu Gln

65

70

<210> 68

<211> 50

<212> PRT

<213> Corynebacterium diphtheriae

<400> 68

His Lys Leu Ser Gln Phe Arg Ala Thr Ile Arg Phe Gly Leu Val Val
1 5 10 15

Ser Lys Ala Val Gly Asn Ala Val Thr Arg His Arg Val Ser Arg Gln
20 25 30

Leu Arg His Phe His Val Val Glu Leu Arg Ala Asp Val Gln Ala Ala
35 40 45

Leu Asp

50

<210> 69

<211> 3

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic

<400> 69

Lys Asn Glu

i

<210> 70

<211> 8

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic

<400> 70

Ala Phe Leu Glu Glu Lys Glu Arg
1 5

<210> 71

<211> 8

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic

<400> 71

Ile Ala Arg Lys Pro Ala Ser Gln
1 5

<210> 72

<211> 4
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 72
Leu Thr Tyr Glu
1

<210> 73
<211> 70
<212> PRT
<213> Bacillus subtilis

<400> 73
Asn Arg Leu Lys Arg Ser Asp Asp Phe Arg Lys Val Phe Arg Val Gly
1 5 10 15
Leu Ser Val Ser Lys Lys Ile Gly Asn Ala Val Met Arg Asn Arg Ile
20 25 30
Lys Arg Leu Ile Arg Gln Phe Phe Gln Glu His Glu Gln Ala Leu Asp
35 40 45
Tyr Ile Ile Ile Ala Arg Lys Pro Ala Ala Asp Met Thr Tyr Glu Glu
50 55 60
Thr Lys Lys Ser Leu Gln
65 70

<210> 74
<211> 69
<212> PRT
<213> Bacillus halodurans

<400> 74
His Arg Ile Lys Lys Asn Asp Glu Phe Ser Arg Val Phe Arg Val Leu
1 5 10 15
Ser Val Ser Lys Lys Ile Gly Asn Ala Val Thr Arg Asn Arg Val Lys
20 25 30
Arg Leu Ile Arg Thr Ser Ile Thr Glu Leu Lys Asp Glu Ile Asp Tyr
35 40 45
Val Ile Ile Ala Arg Lys Pro Cys Ala Glu Met Thr Tyr Glu Gln Val
50 55 60
Lys Gly Ser Leu Trp
65

<210> 75
<211> 70
<212> PRT
<213> Bacillus anthracis

<400> 75
His Arg Ile Lys Lys Asn Phe Glu Phe Gln Thr Val Phe Arg Ile Gly
1 5 10 15
Leu Ser Val Ser Lys Lys Ile Gly Asn Ala Val Val Arg Asn Arg Ile
20 25 30
Lys Arg Met Ile Arg Gln Ile Leu Lys Gln Asn Ile Ser Glu Ile Asp

C
Cont

35 40 45
Phe Val Ile Leu Val Arg Lys Ser Val Leu Glu Leu Lys Tyr Ala Glu
50 55 60
Leu Lys Lys Ser Leu Ile
65 70

<210> 76
<211> 70
<212> PRT
<213> *Mycoplasma capricolum*

<400> 76
Arg Val Ile Lys Asp Arg Lys Glu Phe Gln Glu Ile Ile Lys Tyr Gly
1 5 10 15
Ile Ser Val Gly Lys Lys Ile Gly Asn Ala Val Ile Arg Asn Lys Val
20 25 30
Lys Arg Gln Ile Arg Met Ile Met Arg Glu Gln Phe Cys Asn Ile Asp
35 40 45
Ile Ile Ile Ile Asn Gln Gly Phe Leu Glu Leu Thr Phe Lys Thr
50 55 60
Leu Ser Lys Leu Leu Ile
65 70

<210> 77
<211> 71
<212> PRT
<213> *Mycoplasma pneumoniae*

<400> 77
His His Leu Arg Glu Arg Lys Val Phe Ala Ala Leu Leu Arg Ala Ala
1 5 10 15
Val Ser Ile Ser Lys Thr Lys Tyr Lys Leu Ala Val Glu Arg Asn Leu
20 25 30
Ile Arg Arg Gln Val Lys Ala Ile Phe Gln Gln Ile Ser Asn Asn Leu
35 40 45
Asp Val Leu Val Ile Val Asn Lys Gly Phe Ile Glu Leu Thr Phe Lys
50 55 60
Glu Lys Gln Thr Ile Phe Leu
65 70

C
Cont.

<210> 78
<211> 71
<212> PRT
<213> *Mycoplasma genitalium*

<400> 78
His Ser Leu Arg Arg Glu Lys Val Phe Thr Thr Ile Leu Arg Val Ala
1 5 10 15
Ile Ser Ile Ala Lys Thr Lys Tyr Lys Leu Ala Val Gln Arg Asn Leu
20 25 30
Ile Lys Arg Gln Ile Arg Ser Val Ile Met Ala Leu Gly His Gln Leu
35 40 45
Asp Ile Leu Val Ile Ala Arg Lys Gly Val Glu Ser Leu Glu Tyr Gln
50 55 60
Glu Lys Gln Lys Leu Phe Leu
65 70

<210> 79
<211> 68
<212> PRT
<213> Streptococcus pyogenes

<400> 79
Val Lys Ser Asp Lys Asp Phe Gln Ala Ile Phe Arg Val Gly Ile Ser
1 5 10 15
Val Gly Lys Lys Ile Gly Asn Ala Val Thr Arg Asn Ala Val Lys Arg
20 25 30
Lys Ile Arg His Val Leu Met Glu Leu Gly Pro Tyr Leu Asp Phe Val
35 40 45
Val Ile Ala Arg Lys Gly Val Glu Glu Leu Asp Tyr Ser Glu Leu Gln
50 55 60
Gln Asn Leu His
65

<210> 80
<211> 70
<212> PRT
<213> Streptococcus mutans

<400> 80
Tyr Arg Val Lys Arg Glu Lys Asp Phe Gln Ala Ile Phe Arg Val Gly
1 5 10 15
Leu Ser Val Gly Lys Arg Leu Gly Asn Ala Val Val Arg Asn Ala Ile
20 25 30
Lys Arg Lys Leu Arg His Ile Ile Gln Asn Ala Lys Gly Ser Leu Asp
35 40 45
Phe Val Val Ile Ala Arg Lys Gly Val Glu Thr Leu Gly Tyr Ala Thr
50 55 60
Met Lys Lys Asn Leu Val
65 70

<210> 81
<211> 70
<212> PRT
<213> Streptococcus pneumoniae

*C
Cont.*
<400> 81
Phe Arg Val Lys Lys Asn Ala Asp Phe Lys Ala Ile Phe Arg Val Gly
1 5 10 15
Leu Ser Val Ser Lys Lys Leu Gly Asn Ala Val Thr Arg Asn Gln Ile
20 25 30
Lys Arg Arg Ile Arg His Asn Phe Lys Val His Lys Ser His Leu Asp
35 40 45
Phe Val Val Ile Ala Arg Gln Pro Ala Lys Asp Met Thr Thr Leu Glu
50 55 60
Met Glu Lys Asn Leu Leu
65 70

<210> 82
<211> 70
<212> PRT
<213> Staphylococcus aureus NCTC

<400> 82

Tyr Arg Ile Lys Lys Asn Ala Asp Phe Gln Arg Ile Tyr Arg Leu Gly
1 5 10 15
Ile Ser Val Ser Lys Lys Leu Gly Asn Ala Val Leu Arg Asn Lys Ile
20 25 30
Lys Arg Ala Ile Arg Glu Asn Phe Lys Val His Lys Ser His Ile Asp
35 40 45
Ile Ile Val Ile Ala Arg Gln Pro Ala Lys Asp Met Thr Thr Leu Gln
50 55 60
Ile Gln Asn Ser Leu Glu
65 70

<210> 83

<211> 70

<212> PRT

<213> Staphylococcus aureus COL

<400> 83

Tyr Arg Ile Lys Lys Asp Ser Asp Phe Gln Arg Ile Tyr Arg Leu Gly
1 5 10 15
Ile Ser Val Ser Lys Lys Leu Gly Asn Ala Val Leu Arg Asn Lys Ile
20 25 30
Lys Arg Ala Ile Arg Glu Ala Tyr Arg Leu Asn Ile Asp Glu Lys Ile
35 40 45
Asp Ile Ile Val Ile Ala Arg Val Ser Ser Lys Asp Ile Asp Lys Gln
50 55 60
Ile Gln Asn Ser Leu Glu
65 70

<210> 84

<211> 70

<212> PRT

<213> Clostridium difficile

<400> 84

Lys Gly Leu Lys Asn Ser Glu Asp Phe Arg Lys Val Tyr Arg Val Gly
1 5 10 15
Ile Ser Val Ser Lys Lys Val Gly Lys Ala Ile Thr Arg Asn Arg Val
20 25 30
Arg Arg Leu Ile Lys Glu Val Val Ile Ala Met Lys Asp Gln Ile Asp
35 40 45
Ile Val Phe Val Arg Ala Ile Pro Pro Ala Ala Thr Ala Ser Tyr Glu
50 55 60
Ser Ile Lys Asn Leu Val
65 70

<210> 85

<211> 71

<212> PRT

<213> Synechocystis PCC6803

<400> 85

Leu Arg Leu Lys His Trp Gln Asp Phe Gln Thr Val Tyr Arg Phe Gly
1 5 10 15
Ile Thr Val Ser Gln Lys Val Ser Lys Lys Ala Thr Val Arg Asn Arg
20 25 30

Leu Lys Arg Gln Ile Arg Ala Val Ile Asn His Phe Gln Pro Gln Ile
35 40 45
Asp Val Val Ile Ile Val Leu Pro Gln Gly Ile Gly Cys Asn Tyr Glu
50 55 60
Arg Phe Leu Arg Glu Leu Glu
65 70

<210> 86
<211> 71
<212> PRT
<213> Pseudanabaena PCC6903

<400> 86
Asn Arg Leu Arg Arg Glu Asp Phe Ala Lys Val Tyr Arg Ile Gly
1 5 10 15
Ile Val Val Ser Lys Lys Val Ser Lys Leu Ala Val Thr Arg Asn Arg
20 25 30
Phe Lys Arg Gln Leu Arg Ala Ile Phe Arg Gln Leu Leu Ser Gln Leu
35 40 45
Gln Ile Val Val Thr Val Thr Val Ala Ser Lys Pro Asn Tyr Gln
50 55 60
Glu Leu Gly Asp Asp Leu Lys
65 70

<210> 87
<211> 70
<212> PRT
<213> Borrelia burgdorferi

<400> 87
Ile Ser Leu Lys Ser Lys Ile Glu Ile Gln Lys Ile Phe Arg Ile Leu
1 5 10 15
Val Thr Phe Ser Lys Gly Phe Arg Gly Ser Val Lys Arg Asn Arg Ile
20 25 30
Arg Arg Leu Phe Lys Glu Ala Phe Arg Lys Arg Leu Glu Leu Leu Asp
35 40 45
Ile Ile Phe Val Val Ser Tyr Gly Lys Leu Thr Leu Thr Tyr Phe Ser
50 55 60
Ile Glu Ser Leu Met Lys
65 70

C
cont.
<210> 88
<211> 71
<212> PRT
<213> Treponema pallidum

<400> 88
Glu Arg Leu Arg Gly Ser Cys Arg Val Arg Ala Val Phe Arg Phe Leu
1 5 10 15
Ala Thr Phe Arg Arg Gly Tyr Gly Lys Ala Val Ala Arg Asn Arg Ala
20 25 30
Arg Arg Leu Ser Lys Glu Ala Tyr Arg Ala Leu Lys Ser Ser Leu Asp
35 40 45
Leu Val Leu Leu Val Ser Val Val Glu Asp Ser Leu Ala Ala Tyr Gln
50 55 60
Arg Leu Leu Cys Val Leu Cys

65

70

<210> 89

<211> 73

<212> PRT

<213> Chlamydia trachomatis

<400> 89

Ala Arg Leu Leu Lys Arg Lys Gln Phe Val Tyr Val Gln Lys Val Gly
1 5 10 15
Ile Thr Val Ser Lys Lys Phe Gly Lys Ala His Gln Arg Asn Arg Phe
20 25 30
Lys Arg Ile Val Arg Glu Ala Phe Arg His Val Arg Pro Asn Leu Gln
35 40 45
Val Val Ile Ser Pro Arg Gly Asn Ser Gln Pro Asp Phe Leu Lys Leu
50 55 60
Ser Glu Glu Leu Leu Gln Arg Ile Pro
65 70

<210> 90

<211> 73

<212> PRT

<213> Chlamydia trachomatis MoPn

<400> 90

Ala Arg Leu Leu Lys Arg Lys Gln Phe Val Tyr Val Gln Lys Val Gly
1 5 10 15
Val Thr Val Ser Lys Lys Phe Gly Lys Ala His Gln Arg Asn Arg Phe
20 25 30
Lys Arg Ile Val Arg Glu Ala Phe Arg His Val Arg Pro Asn Leu Gln
35 40 45
Val Val Val Ser Pro Lys Gly Gly Thr Leu Pro Asn Phe Gly Lys Leu
50 55 60
Ser Ala Asp Leu Leu Lys His Ile Pro
65 70

C
cont
<210> 91

<211> 74

<212> PRT

<213> Chlamydia pneumoniae

<400> 91

Ser Arg Val Leu Lys Arg Lys Gln Phe Leu Tyr Ile Thr Arg Met Gly
1 5 10 15
Ile Thr Val Ser Lys Lys Phe Gly Lys Ala His Glu Arg Asn Ser Phe
20 25 30
Lys Arg Val Val Arg Glu Val Phe Arg His Val Arg His Gln Leu Gln
35 40 45
Ile Val Val Phe Pro Lys Gly His Lys Gln Arg Pro Val Phe Ser Lys
50 55 60
Leu Leu Gln Asp Phe Ile Asn Gln Ile Pro
65 70

<210> 92

<211> 74

<212> PRT

<213> Thermotoga maritima

<400> 92

Glu Arg Leu Arg Leu Arg Arg Asp Phe Leu Leu Ile Phe Arg Leu Gly
1 5 10 15
Ile Val Val Lys Arg Lys Phe Gly Lys Ala Thr Arg Arg Asn Lys Leu
20 25 30
Lys Arg Trp Val Arg Glu Ile Phe Arg Arg Asn Lys Gly Val Ile Asp
35 40 45
Ile Val Val Ile Pro Arg Lys Lys Leu Ser Glu Glu Phe Glu Arg Val
50 55 60
Asp Phe Trp Thr Val Arg Glu Lys Leu Leu
65 70

<210> 93

<211> 78

<212> PRT

<213> Porphyromonas gingivalis

<400> 93

Glu Arg Leu Tyr Leu Arg Asp Glu Ile Asn Thr Val Phe Ser Met Leu
1 5 10 15
Val Ser Val Ala Lys Lys Arg Phe Arg Arg Ala Val Lys Arg Asn Arg
20 25 30
Val Arg Arg Leu Val Arg Glu Ala Tyr Arg Leu Asn Lys His Leu Leu
35 40 45
Asp Val Leu Gln Glu Arg Gln Ile Tyr Ala Thr Ile Ala Phe Met Val
50 55 60
Val Ser Asp Glu Leu Pro Asp Phe Arg Thr Val Glu Arg Ala
65 70 75

<210> 94

<211> 77

<212> PRT

<213> Deinococcus radiodurans

<400> 94

Leu Arg Gly Glu Arg Glu Phe Arg Lys Val Arg Arg Ile Gly Leu Val
1 5 10 15
Val Ser Lys Lys Thr Leu Lys His Ala Val Lys Arg Asn Arg Ala Arg
20 25 30
Arg Arg Val Arg Glu Ala Leu Arg Thr Met Pro Pro Glu Leu Arg Ala
35 40 45
Ile Leu Met Leu Asn Pro Gly Val Leu Thr Val Pro Phe Pro Glu Leu
50 55 60
Gln Ala Ala Leu Ala Gln Ala Leu Gln Arg Gly Ala Gly
65 70 75

<210> 95

<211> 75

<212> PRT

<213> Chlorobium tepidum

<400> 95

Ala Arg Leu Lys Gly Gly Phe Leu Leu Leu Ile Arg Val Leu Phe Thr

1 5 10 15
Val Gly Lys Lys Leu Val Pro Arg Ala Val Asp Arg Asn Arg Ile Lys
20 25 30
Arg Leu Met Arg Glu Ala Tyr Arg Leu Glu Lys Asn Ile Leu Asp His
35 40 45
Gln Val Met Leu Ala Phe Leu Tyr Arg Ala Arg Ala Asp Ala Ile Pro
50 55 60
Ser Leu Glu Arg Phe Arg Ala Ile Arg His Met
65 70 75
